### CURRICULAR LAYOUT FOR THE DEGREE OF DVM

#### LEVEL-1, SEMESTER-1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit hrs</th>
<th>Contact hrs.</th>
<th>No. of courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAH 111, 112</td>
<td>Anatomy (Osteology, Arthrology, Myolog and Angiology)</td>
<td>3+1</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>VAH 114</td>
<td>General Histology and Embryology</td>
<td>0+1</td>
<td>2</td>
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</tr>
<tr>
<td>VPHY 111, 112</td>
<td>Basic and Circulatory Physiology</td>
<td>2+1</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>BCHEM 111, 112</td>
<td>Biophysics and Chemistry of Biomolecules</td>
<td>3+1</td>
<td>5</td>
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</tr>
<tr>
<td>AS115, 116</td>
<td>Animal Science</td>
<td>3+1</td>
<td>5</td>
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<tr>
<td>LAN 111</td>
<td>English Language</td>
<td>2+0</td>
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<tr>
<td>CSM 112</td>
<td>Computer Application</td>
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<td><strong>Total:</strong></td>
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<td><strong>25</strong></td>
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#### LEVEL-1, SEMESTER-2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit hrs</th>
<th>Contact hrs.</th>
<th>No. of courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAH 121, 122</td>
<td>Anatomy (Splanchnology, Neurology and Aesthesiology)</td>
<td>3+1</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>VAH 123, 124</td>
<td>Systemic Histology</td>
<td>3+1</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>VPHY 121, 122</td>
<td>Integral Physiology</td>
<td>1+1</td>
<td>3</td>
<td>2</td>
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<tr>
<td>VMH 121, 122</td>
<td>Bacteriology</td>
<td>3+1</td>
<td>5</td>
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<tr>
<td>BCHEM 123, 124</td>
<td>Metabolism of Biomolecules</td>
<td>3+1</td>
<td>5</td>
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<tr>
<td>PS 123,124</td>
<td>Elementary Poultry Science</td>
<td>3+1</td>
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<tr>
<td><strong>Total:</strong></td>
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#### LEVEL-2, SEMESTER-1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit hrs</th>
<th>Contact hrs.</th>
<th>No. of courses</th>
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<tbody>
<tr>
<td>VAH 216</td>
<td>Comparative Anatomy and Neuroanatomy</td>
<td>0+1</td>
<td>2</td>
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<tr>
<td>VPHY 211</td>
<td>Nutritional Physiology</td>
<td>2+0</td>
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<tr>
<td>VMH 211, 212</td>
<td>Virology</td>
<td>3+1</td>
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<tr>
<td>VPAR 211, 212</td>
<td>General Parasitology, Helminthology and Malacolog</td>
<td>3+1</td>
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<tr>
<td>AGRON 211, 212</td>
<td>Forage Agronomy</td>
<td>2+1</td>
<td>4</td>
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<tr>
<td>STAT 215, 216</td>
<td>Biostatistics</td>
<td>2+1</td>
<td>4</td>
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<tr>
<td>DS 213, 214</td>
<td>Elementary Dairy Science</td>
<td>3+1</td>
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#### LEVEL-2, SEMESTER-2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit hrs</th>
<th>Contact hrs.</th>
<th>No. of courses</th>
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<tbody>
<tr>
<td>VPHY 221</td>
<td>Endocrine and Reproductive Physiology</td>
<td>2+0</td>
<td>2</td>
<td>1</td>
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<tr>
<td>VMH 222</td>
<td>Mycology, Rickettisology, Mycoplasmology and Chlamydiology</td>
<td>0+1</td>
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<tr>
<td>VMH 223, 224</td>
<td>Immunology and Serology</td>
<td>2+1</td>
<td>4</td>
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<tr>
<td>VPAR 221, 222</td>
<td>Entomology</td>
<td>2+1</td>
<td>4</td>
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<tr>
<td>VPATH 221, 222</td>
<td>General Pathology</td>
<td>3+1</td>
<td>5</td>
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<tr>
<td>VPHA 221, 222</td>
<td>General Pharmacology and Chemotherapeutics</td>
<td>3+1</td>
<td>5</td>
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<tr>
<td>AN 223, 224</td>
<td>Animal Nutrition</td>
<td>3+1</td>
<td>5</td>
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<td><strong>Total:</strong></td>
<td><strong>15+6=21</strong></td>
<td><strong>27</strong></td>
<td><strong>12</strong></td>
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<tr>
<td>Course No.</td>
<td>Course Title</td>
<td>Credit hrs</td>
<td>Contact hrs</td>
<td>No. of courses</td>
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<tr>
<td>VAH 318</td>
<td>Applied Anatomy (Topographic and surgical anatomy)</td>
<td>0+1</td>
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<tr>
<td>VMH 311, 312</td>
<td>Animal and Poultry Hygiene and Management</td>
<td>3+1</td>
<td>5</td>
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<tr>
<td>VPAR 311, 312</td>
<td>Protozoology</td>
<td>2+1</td>
<td>4</td>
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<tr>
<td>VPHA 311</td>
<td>Systemic Pharmacology</td>
<td>3+0</td>
<td>3</td>
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<td>VPATH 311, 312</td>
<td>Systemic Pathology and Oncology</td>
<td>3+1</td>
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<tr>
<td>VM 311, 312</td>
<td>Clinical Methodology</td>
<td>2+1</td>
<td>4</td>
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<tr>
<td>AS 311, 312</td>
<td>Animal Waste Management</td>
<td>2+1</td>
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<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit hrs</th>
<th>Contact hrs</th>
<th>No. of courses</th>
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<tbody>
<tr>
<td>VPATH 321</td>
<td>Pathology of Infectious and Non-Infectious Diseases</td>
<td>2+0</td>
<td>2</td>
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<tr>
<td>VPHA 321, 322</td>
<td>Toxicology</td>
<td>3+1</td>
<td>5</td>
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<tr>
<td>VM 321, 322</td>
<td>Epidemiology and Preventive Medicine</td>
<td>3+1</td>
<td>5</td>
<td>2</td>
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<tr>
<td>VM 323, 324</td>
<td>Systemic Diseases of Farm Animals</td>
<td>3+1</td>
<td>5</td>
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<tr>
<td>VSO 321, 322</td>
<td>General Surgery</td>
<td>3+1</td>
<td>5</td>
<td>2</td>
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<tr>
<td>ABG 329, 330</td>
<td>Genetics and Animal Breeding</td>
<td>3+1</td>
<td>5</td>
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<td></td>
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<tr>
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<th>Credit hrs</th>
<th>Contact hrs</th>
<th>No. of courses</th>
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<tbody>
<tr>
<td>VPATH 411, 412</td>
<td>Poultry Pathology</td>
<td>2+1</td>
<td>4</td>
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<tr>
<td>VM 411, 412</td>
<td>Small, Zoo and Laboratory Animal Medicine</td>
<td>3+1</td>
<td>5</td>
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<tr>
<td>VM 413</td>
<td>Metabolic and Nutritional Diseases of Farm Animals</td>
<td>3+0</td>
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<tr>
<td>VSO 411</td>
<td>Anesthesiology</td>
<td>3+0</td>
<td>3</td>
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<tr>
<td>VSO 413, 414</td>
<td>Obstetrics and Gynaecology</td>
<td>3+1</td>
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<tr>
<td>FS 413, 414</td>
<td>Livestock Farm Design and Environment</td>
<td>3+1</td>
<td>5</td>
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<tr>
<td>FPM 4101, 4102</td>
<td>Farm Operation and Management</td>
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<th>Contact hrs</th>
<th>No. of courses</th>
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<tbody>
<tr>
<td>VM 421, 422</td>
<td>Infectious Diseases of Farm Animals</td>
<td>3+1</td>
<td>5</td>
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<tr>
<td>VM 423, 424</td>
<td>Poultry Medicine</td>
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<tr>
<td>VSO 423, 424</td>
<td>Radiology and Soundness</td>
<td>2+1</td>
<td>4</td>
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<tr>
<td>VMH 421, 422</td>
<td>Food Hygiene, Microbiology and Safety</td>
<td>2+1</td>
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<tr>
<td>VSO 425, 426</td>
<td>Andrology and Artificial Insemination</td>
<td>2+1</td>
<td>4</td>
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<tr>
<td>AGEXT 423, 424</td>
<td>Agricultural Extension Education</td>
<td>3+1</td>
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<th>Credit hrs</th>
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<th>No. of courses</th>
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<tbody>
<tr>
<td>VPHA 512</td>
<td>Clinical Pharmacology and Pharmacy</td>
<td>0+1</td>
<td>2</td>
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<tr>
<td>VPATH 512</td>
<td>Clinical Pathology and Necropsy</td>
<td>0+1</td>
<td>2</td>
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<tr>
<td>VM 512</td>
<td>Clinics (Medicine)</td>
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<tr>
<td>VSO 512</td>
<td>Clinics (Theriogenology)</td>
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<td>VSO 514</td>
<td>Clinics (Surgery)</td>
<td>0+1</td>
<td>2</td>
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<tr>
<td>VMH 511</td>
<td>Veterinary Public Health</td>
<td>2+0</td>
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<tr>
<td>VM 511</td>
<td>Forensic Medicine, Jurisprudence and Animal Welfare</td>
<td>2+0</td>
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<td>VSO 517, 518</td>
<td>Operative Surgery</td>
<td>3+1</td>
<td>5</td>
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<tr>
<td>AE 511, 512</td>
<td>Livestock Production Economics</td>
<td>3+1</td>
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<tbody>
<tr>
<td></td>
<td>Internship</td>
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**LEVEL-3, SEMESTER-1**

**LEVEL-3, SEMESTER-2**

**LEVEL-4, SEMESTER-1**

**LEVEL-4, SEMESTER-2**

**LEVEL-5, SEMESTER-1**

**LEVEL-5, SEMESTER-2**
SYLLABUS FOR DVM DEGREE

Department of Anatomy and Histology

Level I, Semester I

COURSE NO.: VAH 111
Course Title: Anatomy (Osteology, Arthrology, Myology and Angiology)
Credit hour: 3

1. Introduction: Definition, importance, classification of anatomy, topographic and descriptive terms.
2. Osteology: Skeleton, structure, composition and classification of bones of domestic animals and birds.
3. Arthrology: Definition and classification of joints, characteristics of a typical joint and its associated structures of domestic animals and birds.
4. Myology: Muscles of the different regions of the body of domestic animals and birds.
5. Angiology: Organs of circulation of domestic animals and birds.

Department of Anatomy and Histology

Level I, Semester I

COURSE NO.: VAH 112
Course Title: Anatomy (Osteology, Arthrology, Myology and Angiology)
Credit hour: 1

Morphological characters of the bones, joints, muscles and organs of circulation as per theory courses.

Books Recommended (VAH 111 & 112)

Department of Anatomy and Histology

Level I, Semester II

COURSE NO.: VAH 121
Course Title: Anatomy (Splanchnology, Neurology and Aesthesiology)
Credit hour: 3

1. Splanchnology: The digestive, respiratory, urogenital and endocrine system of domestic animals and birds.
2. Aesthesiology: Special sense organs (eye, ear, olfactory and gustatory apparatus) and common integument of domestic animals and birds.
3. Neurology: Definition and classification of nervous system, neuron, structures/organs of the nervous system (brain, spinal card, nerve, nerve trunk and nerve plexuses) of domestic animals and birds.

Department of Anatomy and Histology

Level I, Semester II

COURSE NO.: VAH 122
Course Title: Anatomy (Splanchnology, Neurology and Aesthesiology)
Credit hour: 1

Morphological characters of all the visceral organs, sense organs, endocrine organs and organs of circulation of domestic animals and birds.

Books Recommended (VAH 121 & 122):

Department of Anatomy and Histology
Level II, Semester I
COURSE NO.: VAH 216
Course Title: Comparative Anatomy and Neuroanatomy
Credit hour: 1

Comparative Anatomy:
Comparative study of the bones and visceral organs (digestive, respiratory, urogenital, cardiovascular and nervous system) of horse, cattle, goat, sheep, dog, cat and birds.

Neuroanatomy:
1. Introduction to Neuroanatomy
2. Structures of the central nervous system (CNS) and its coverings.
4. Origin, course and distribution of cranial and spinal nerves.
5. Autonomic nervous system (ANS)

Books Recommended

Department of Anatomy and Histology
Level III, Semester I
COURSE NO.: VAH 318
Course Title: Applied Anatomy (Topographic and Surgical Anatomy)
Credit hour: 1

1. Introduction to topographic and surgical anatomy
2. Surface anatomy of the head, neck, thorax, abdomen, pelvis and limbs of domestic animals and surgical intervention.
3. Topographic location of the organs of different systems of the body of domestic animals and birds in relation to surgery.
4. Cranial and spinal nerves with reference to their surgical intervention of domestic animals and birds.

Books Recommended:
4. Veterinary Operative Surgery. (1966), Dr. H.C. Elwald Berge and Dr. H.C. Melchior Westhues. 1st edition, Medical Book Company, Denman.
6. Veterinary Surgical Techniques by A. Kumar, 2nd Reprint 2000, Typest at Print Craft, New Delhi-110 005.

Department of Anatomy and Histology
Level I, Semester I
COURSE NO.: VAH 114
Course Title: General Histology and Embryology
Credit hour: 1

1. Microscope and its handling.
2. General staining technique and preparation of the histological slides.
3. Microscopic study of cell and cell division.
4. Microscopic study of basic tissues of animal body: Epithelial tissue, connective tissue, muscular tissues, nervous tissue and blood.
5. Gametogenesis, cleavage and gastrulation.
6. Demonstration of chick’s embryo at different stages of development.

Books Recommended:

Department of Anatomy and Histology
Level I, Semester II
COURSE NO.: VAH 123
Course Title: Systemic Histology
Credit hour: 3

Histology of different systems of domestic animals and birds:
1. Digestive system: Segments of the alimentary tract and accessory organs.
2. Respiratory system: Nasal passages, larynx, trachea and the lungs.
3. Circulatory system: Organs of circulation (heart and blood vessels), lymphatic tissues and organs.
5. Genital system: Male and female reproductive organs.
7. Skin and appendages.

Department of Anatomy and Histology
Level I, Semester II
COURSE NO.: VAH 124
Course Title: Systemic Histology
Credit hour: 1

Histological study of the organs of different systems of domestic animals and birds as per theory courses.

Books Recommended (123 & 124)

Department of physiology
Level-I, Semester-1
COURSE NO: VPHY – 111
Course Title: Basic and Circulatory Physiology
Credit hour: 2

Introduction:
Organization of the cell, Physical structure and functional system of the cell.
Physiological phenomenon, Transport through the cell membrane- Active and Passive process . Membrane potentials, Action potentials, excitation and rhythmicity.

Blood:
Properties, Cellular and chemical constituents of blood, Hemoglobin, Hematopoiesis, Fate of blood cells, Blood volume, Abnormalities of blood cells (anemia, polycythemia, leukocytosis, blood cancer etc), Blood coagulation, Haemaglutination, Blood groups and immunogenetics, Plasma and serum, Clinical parameters of blood.
Other body fluid:
Tissue fluid, lymph, synovial fluid and cerebrospinal fluid, their formation and functions.

Cardiovascular Physiology:
Heart, Courses of circulation, Special circulations, Origin and conduction heart beat, action potential and cardiac cycle, Electrocardiogram, Heart sounds, Heart block, Regulation of heart.
Blood vessels, Blood pressure, vasomotor mechanism.

Department of physiology

Level-I, Semester-1

COURSE NO: VPHY – 112
Course Title: Basic and Circulatory Physiology
Credit hour: 1

Preparation of chemicals and reagents for hematological studies.
Collection of blood from different animals and birds.
Study of hemolysis and estimation of hemoglobin,
Determination of erythrocyte sedimentation rate and Packed cell volume,
Total count of RBC and WBC, differential leukocyte count, Hemin test.
Effects of temperature and drugs in heart.

Books Recommended:( VPHY-111 & 112)
4. Hematology and Urinalysis by S L Lamberg and R Rothstein, AVI Publishing Company, USA.

Department of physiology

Level-I, Semester-2

COURSE NO: VPHY – 121
Course Title: Integral Physiology
Credit hour: 1

Urinary system:
Functions of kidney. Urine formation, urine volume regulation, micturition, renal clearance.
Respiratory system:
Definition, types, mechanisms of respiration, exchange and transport of respiratory gases, volumes of air respired, regulation of respiration, pulmonary compliance, Respiration in birds.
Muscular system:
Properties and functions of muscles, isotonic and isometric contraction, changes in the muscle during contraction, rigormortis.
Nervous system:
Neuron, classification, nerve, stimuli, receptors, synapse, nerve impulse, autonomic nervous system.

Temperature regulation:
Core and shell temperature, adaptation of animals in different climatic conditions, hypothermia and hyperthermia, hibernation, heat stroke and sunstroke, frostbite.
Homeostasis:

Department of physiology

Level-I, Semester-2

COURSE NO: VPHY – 122
Course Title: Integral Physiology
Credit hour: 1

Tests for bile constituents.
General chemistry of urine. Physical examination of urine e.g. volume, colour, odour, transparency. Determination of specific gravity of urine.

Estimation of ammonia, chloride, phosphate.

Test for abnormal constituents of urine eg. glucose, albumin, acetone, calcium, bile pigment, bile salts etc. Microscopic examination of urinary sediments.

Pregnancy determination by barium chloride test.

Determination of respiratory air volumes.

**Books Recommended:** (VPHY-121 & 122)

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**Department of Physiology**

**Level-2, Semester-1**

**COURSE NO: VPHY – 211**

Course Title: Nutritional Physiology

Credit hour: 2

**Livestock feed:**

Feeds of ruminants, monogastric animals and birds, composition of feed stuffs, feed supplements, balanced diet

**Digestion:**

Digestion of feed stuffs, factors of digestion, prehension, mastication, composition, function and regulation of digestive juices.

Digestion in simple and compound stomached animal. Movement of gastrointestinal tract, feces and defecation. Digestion in birds.

**Absorption of Nutrients:**

Sites, routes and mechanism of absorption. Absorption of carbohydrate, protein, fat, vitamins, minerals and water.

**Utilization of Nutrients:**


Disorders of carbohydrate, protein and fat metabolism. Factors affecting metabolism.

**Vitamins and Minerals:**

Fat and Water Soluble Vitamins - their sources, functions and deficiency symptoms in animals and birds. Major (Calcium, Phosphorus, Magnesium, Sodium, Potassium, Sulphur) and trace (Iron, Copper, Cobalt, Manganese, Zinc) elements- their sources, functions and deficiency symptoms in animals and birds.

**Books Recommended:**

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**Department of physiology**

**Level-2, Semester-2**

**COURSE NO: VPHY – 221**

Course Title: Endocrine & Reproductive Physiology

Credit hour: 2

**Endocrinology:**

Introduction, Hormone: classification, mode of action, regulation of hormone secretion. Hormones of pituitary, thyroid, adrenal, parathyroid, pineal, pancreas, testis, ovary, corpus luteum, uterus and placenta - their secretions, mode of action and function.

**Reproductive Physiology:**

**Male:** Spermatogenesis, transportation of spermatozoa, semen, capacitation. Preservation of spermatozoa for artificial insemination, Thermoregulation of testis. Male sex hormones, their mode of action and functions.


Books Recommended:

Department of Microbiology and Hygiene

Level 1, Semester 2

COURSE NO.: VMH 121
Course Title: Bacteriology
Credit hour: 3

History, development and concepts of Microbiology with special emphasis on Bacteria. Definition and general properties of Bacteria. Differentiation of prokaryote from eukaryote. Morphology, microscopic and ultramicroscopic structures including their composition and function of Bacteria. Nutrition, cultivation and growth of Bacteria.

Physiology and metabolism of Bacteria.

Bacterial genetics: Replication of DNA and RNA, plasmid, gene transfer (transformation, conjugation, transduction, F-factor, C-factor and R-factor) mutation and their effects.

Pathogenic microorganisms and their relationship to diseases; Mechanisms of infection. Microbial virulence: Factors influencing virulence, Koch's postulate.


Molecular Bacteriology: Genomic DNA, Plasmid DNA, PCR, Gel electrophoresis, Pulse-field gel electrophoresis, Recombinant Bacteriology technology: Cloning and gene expression, hybridization techniques, SDS-PAGE, Western blotting, and immuno-chemiluminescent assay.

Department of Microbiology and Hygiene

Level 1, Semester 2

COURSE NO.: VMH 122
Course Title: Bacteriology
Credit hour: 1


Books Recommended: (VMH 121 & 122)
Department of Microbiology and Hygiene

Level 2, Semester 1
COURSE NO.: VMH 211
Course Title: Virology
Credit hour: 3

History of Virology, definition, general properties of Virus and differentiation of Virus from other Microorganisms.
Composition and functions of viral structures, antigenic determinants or epitopes.
Physical, chemical and biological properties of Viruses. Nomenclature and classification of Viruses.
Viral genetics: Scope, Genetic map and viral genome organization.
Inactivation and preservation of Viruses.
Purification of Viruses.
Replication of Viruses and their effects on host at cellular and multi-cellular level.
Molecular Virology: Definition and scope of Molecular Virology. Viral DNA and RNA, PCR, RT-PCR, Gel electrophoresis, Pulse-field gel electrophoresis, Recombinant DNA technology: Cloning and gene expression, Hybridization techniques, SDS-PAGE, Western blotting and Immuno-chemiluminescent assay.
Bacteriophage.
Epidemiology of Viral Infection.
Resistance to Viral infection and immunity: Interference phenomenon and interferon.
Viral vaccines and chemotherapy.
Persistent Viral infection and slow Viruses.
Studies on the properties, cultivation, pathogenicity, transmission, immunity and diagnosis of different Virus families: Paramyxoviridae, Orthomyxoviridae, Rhabdoviridae, Coronaviridae, Retroviridae, Picornaviridae, Reoviridae, Togaviridae, Flaviviridae, Bunyaviridae, Birnaviridae, Circoviridae, Papovaviridae, Adenoviridae, Herpesviridae and Iridoviridae of animals, birds and human.

Department of Microbiology and Hygiene

Level 2, Semester 2
COURSE NO.: VMH 212
Course Title: Virology
Credit hour: 1


Books Recommended: (VMH 211 & 212)
Fungi: Classification, properties, sample collection, preservation, transportation and cultivation of the important fungi of animals, poultry and man. Diagnosis of fungi by culture, staining, biochemical tests and molecular techniques.

Mycoplasma: Classification, properties, sample collection, preservation, transportation and cultivation of the important animal and poultry mycoplasma. Diagnosis of mycoplasma by culture, staining, biochemical and serological tests and molecular techniques.

Rickettsia: Classification, properties, sample collection, preservation, transportation and cultivation of the important animal and human rickettsia. Diagnosis of rickettsia by culture, staining, biochemical and serological tests and molecular techniques.

Chlamydia: Classification, properties, sample collection, preservation, transportation and cultivation of the important animal, poultry and human chlamydia. Diagnosis of chlamydia by culture, staining, biochemical and serological tests and molecular techniques.

Books Recommended


History and modern concepts of Immunology and Serology.
Organs and cells associated with immunity.


Antibody: Definition, properties, types and function. Theory of antibody (Ab) production. Antigen-antibody reaction and their consequences.

Chemical Mediators of the Immune system. Complement system and their role in immunity.

COURSE NO.: VMH 224
Course Title: Immunology and Serology
Credit hour: 1

Preparation and purification of antigens. Reagents employed in serological tests, detection and measurement of antibody. RBC suspension preparation. Collection of sera from immunized and non-immunized animals, poultry and laboratory animals. Hyperimmune sera preparation. Procedures and uses of different serological tests: Agglutination test, precipitation test, hemagglutination activity, Hemagglutination –inhibition, Passive hemagglutination tests, Complement fixation test, Fluorescent antibody technique (FAT), Enzyme linked immunosorbent assay (ELISA), Immunohistochemical techniques, Immundiffusion test, Serum neutralization test (SNT), Focus inhibition test (FIT) and Protection test (PT).

Books Recommended:( VMH 223 & 224)

Department of Microbiology and Hygiene
Level 5, Semester 1
COURSE NO.: VMH 511
Course Title: Veterinary Public Health
Credit hour. 2


Public Health Team: Organization, administration and function. The role of veterinarians and other related professional in the protection of human health through the safe production of foods of animal origin.


Concepts, scope, objective and type of Epidemiology. Ecology and ecological imbalance. Disease surveillance and risk analysis. Disseminating information on veterinary public health; quality and safety assurance in food production (meat, milk and eggs).

Causes of multifactorial diseases: Agents, host and environmental factors.

General methods of epidemiological investigation of zoonotic diseases.


The consumer: food technology & veterinary public health

Books Recommended
Department of Microbiology and Hygiene
Level 4, Semester 2
COURSE NO.: VMH 421
Course Title: Food Hygiene, Microbiology and Safety
Credit hour: 2

History of microorganisms in food. Role and significance of microorganisms in nature and foods.
Microorganisms important in foods of animal and avian origin. General principles of food preservation and spoilage.

Meat hygiene practices: Antemortem and post-mortem examination; transportation of meat animals; slaughtering of animals and birds. Slaughter-house management, use, treatment and disposal of abattoir by-products. Preharvest and postharvest technology of foods at farm and manufacturing level.

Abattoir: Principles for planning of an abattoir and situation in Bangladesh. Inspection of carcasses, judgment of carcasses and examination reports. Adulteration and misrepresentation of meat foods. Diseases transmitted through meat and meat products.


Fish-borne diseases: Contamination and spoilage of fish products; factors affecting kinds and rate of spoilage. Preservation of fish and fish products.

Eggs: Contamination and spoilage of eggs; preservation of eggs.


Department of Microbiology and Hygiene
Level 4, Semester 2
COURSE NO.: VMH 422
Course Title: Food Hygiene, Microbiology and Safety
Credit hour: 1

Applied techniques in sampling of foods of animal origin and other related materials for Microbiological studies:

i) Sampling of solid, liquid and surface samples.

ii) Preparation of dilutions, determinations of MPN index and general viable counts.

iii) Detection and enumeration of indicator bacteria.

iv) Detection and enumeration of pathogenic and toxigenic organisms.

v) Determination of F-value, D-values and Z-values.

Microbiological examination of specific foods:

(i) Meat and Meat product. (ii) Liquid milk, dry milk and other milk products.


Determination of milk fats
Sample collection and laboratory examination for assessment of hygienic quality of meat.

PH determination of meat, chemical and organoleptic equality assessment.

Determination of quality of foods in terms of safety and quality assurance (report writing)

Differentiation between perfect and imperfect bleeding. Inspection and judgement of carcasses and meat of various food animals.

Field trips to slaughterhouse milk and fish processing plants.

Books Recommended:(VMH 421 & 422)

**Department of Microbiology and Hygiene**

**Level 3, Semester 1**

**COURSE NO.: VMH 311**

Course Title: Animal and Poultry Hygiene and Management

Credit hour: 3


Influences of environmental factors: Soil, Air, Ventilation, Water and housing on animal and poultry health.

Sanitation: Definition and objectives, drainage, sewerage system and disposal of wastes. Cleaning and disinfections of poultry houses and equipments; disinfectants and their application; fumigation and its importance. Hygienic and economic importance of housing and selection of sites for animal and poultry farm, concepts of modern housing, internal arrangement and space requirement for housing of livestock and poultry including laboratory animals. Safety of animal and poultry feed ingredients. Hygienic preparation of livestock and poultry houses before receiving the newly introduced livestock and poultry. Hygienic environments for rearing of livestock and poultry.

Hygienic requirements of pre-brooding and brooding conditions for the management of chicks.


**Department of Microbiology and Hygiene**

**Level 3, Semester 1**

**COURSE NO.: VMH 312**

Course Title: Animal and Poultry Hygiene and Management

Credit hour: 1

Demonstration of external points of livestock and poultry. Identification of livestock and poultry: Breed, species etc.

Manipulation and restraining of livestock and poultry.


**Books Recommended : (VMH 311 & 312)**

Department of Parasitology
Level 2, Semester I
COURSE NO. VPAR 211

Course title: General Parasitology, Helminthology and Malacology

Credit hour: 3

A brief introduction to Parasitology, types of animal association and parasitism, and types of parasites and hosts.
History of Parasitology, origin and evolution of parasites.
Host - parasite relationship and adaptation of parasites.
Host specificity, organ specificity and host range.
Zoological nomenclature and classification of parasitic helminth.
General morphology of helminths.
Geographical distribution and transmission of parasites.
Definition and general pattern of life cycle of helminth.
Principles of parasitic immunity and expression of immunity against parasites.
A brief study on the morphology, geographical distribution, life cycle, economic importance and control principles of the following helminths of livestock and poultry.
**Trematoda:** Fasciolidae, Paramphistomatidae, Schistosomatidae, Dicrocoeliidae, Echinostomatidae, Prosthogonimidae, Troglotrematidae, Notocotylidae and Opisthorchiidae.
**Cestoda:** Taeniidae, Dilepididae, Davaineidae, Anoplocephalidae, Hymenolepidae, Diphyllobothriidae.
**Nematoda:** Ascarididae, Heterakidae, Oxyuridae, Strongylidae, Stephanuridae, Ancylostomatidae, Trichostrongylidae, Dictyocaulidae, Metastrongylidae, Protostrongylidae, Filaroididae, Strongyloididae, Filariidae, Dracunculidae, Spiruridae, Acuaridae, Thelaziidae, Gnathostomatidae, Trichuridae, Trichnellidae, Dioctophymatidae.
A brief introduction to Malacology,
Classification, Morphology, Biology and Ecology of common fresh water snails.
Role of mollusks in the transmission of common helminth parasites of livestock and poultry.
Principles of snail control.
General control principles of parasites.

Department of Parasitology
Level 2, Semester I
COURSE NO. VPAR 212

Course title: General Parasitology, Helminthology and Malacology

Credit hour : 1

Preparation of reagents and their uses
Identification of Helminth’s eggs
Faecal sample examination: Qualitative Methods
Faecal sample examination: Quantitative Methods
Identification of cercariae

**Identification of metacestodes**
Identification of nematode larvae
Coproculture
Collection of helminths from visceral organs of ruminants and their preservation
Collection of helminths from visceral organs of poultry and their preservation
Detection of nematode larvae from field samples (grass, herbage, etc) by using Baermann’s Apparatus
Rodent perfusion for the collection of blood fluke
Preparation of permanent slide
Preparation of temporary slide and supravital staining
Identification of Trematodes
Identification of Nematodes
Identification of Cestodes
Microscopic measurement of helminths and their eggs
Collection and shipment of snails
Morphological study of snails and their identification
Examination of snails for the recovery of cercariae
Immunodiagnosis of parasitic infection

Books Recommended: (VPAR 211 & 212)

Department of Parasitology
Level 2, Semester II
COURSE NO. VPAR 221

Course title: Entomology
Credit hour: 2

Introduction to Veterinary and Medical Entomology.
Classification and structure of common insects and arachnids, Vectors and vector status.
Morphology, biology, disease relationship, economic importance and control of insects and arachnids of the following groups:
Diptera: Culicidae, Ceratopogonidae, Psychodidae, Simuliidae, Tabanidae, Glossinidae, Muscidae, Fanniidae, Calliphoridae, Sarcophagidae, Oestridae, Hippoboscidae.
Siphonaptera, Hemiptera, Phthiraptera, Dictyoptera, Coleoptera, Lepidoptera, Hymenoptera.
Acari:
Mites: Astigmatia, Oribatida/Cryptostigmata, Prostigmata, Mesostigmata.
Ticks: Ixodida – Argasidae and Ixodidae
Pentastomida
Control principles of arthropod pests and vectors.
Pesticides and pesticide formulations and pesticide resistance.

Department of Parasitology
Level 2, Semester II
COURSE NO. VPAR 222

Course title: Entomology
Credit hour: 1

Collection, Shipment and preservation of arthropod samples.
Preparation of permanent slides, storage and handling of arthropod samples.
Diagnostic techniques and identification of important insects (Fly, Mosquitoes, lice, flea etc), arachnids (Ticks, Mites) and Pentastomida (Tongue warm).

Books Recommended: (VPAR-221 & 222)
Introduction to Protozoa and Protozoology.

Taxonomy, morphology, life cycle, epidemiology, immunology and economic importance of the protozoa belonging to the following families: Trypanosomatidae, Hexamitidae, Monocercomonadidae, Trichomonadidae, Vahlkampfiidae, Endamoebidae, Haemogregarinidae, Eimeriidae, Cryptosporidiidae, Sarcocystidae, Plasmodiidae, Babesiidae, Theileriidae, Balantidiidae.

Brief account of the pathogenesis, clinical signs and lesions caused by the important protozoa.
Diagnosis and control of the important protozoa.
Important Rickettsiales of Animals and Poultry in Bangladesh.

Books Recommended: (VPAR 311 & 312)


Department of Pathology
Level II, Semester II
COURSE NO. : VPATH 221
Course Title: General Pathology
Credit hour : 3

Introduction: Definition, branches and scope of Pathology
Cell injury, cell death and necrosis: Causes of cell injury and death, biochemical and ultrastructural changes in accidental cell death and apoptosis, characteristics of necrotic cells and tissues; differentiation of necrosis and postmortem autolysis; types of necrosis; disposition of necrotic tissues; gangrene; infarct.

Intracellular and extracellular depositions; degenerations: Fatty change, extracellular accumulation of lipids; glycogen deposition and glycogen storage diseases; lysosomal storage diseases; extracellular deposition of proteins – amyloid, albumin and fibrin.

Mineral deposits and pigments: Pathologic calcifications and ossification; gout; exogenous pigments; endogenous pigments-melanosis, hemosiderosis, jaundice, photosensitivitysional dermatitis.

Disturbances of growth: Aplasia, hypoplasia, atrophy, hypertrophy, hyperplasia, metaplasia, anaplasia, dysplasia, neoplasia.

Disturbances of circulation: Thrombosis and embolism; failure to clot and hemorrhage; hyperaemia and congestion; edema; shock.

Inflammation: Definition and cardinal signs; vascular and cellular events in inflammation; chemical mediators of inflammation; cells of inflammation; types of inflammation; healing.

Immunopathology: Immune response and immune effector mechanisms; hypersensitivity; autoimmunity; immunodeficiency.

Department of Pathology
Level II, Semester II

COURSE NO. : VPATH 222
Course Title: General Pathology
Credit hour : 1

Methods of collection, preservation, fixation, processing and staining of pathological specimens.

Study of basic alterations of cells and tissues using laboratory specimens, histopathological slides, illustrations and transparencies.

Books recommended (VPATH 221 & 222)

Department of Pathology
Level III Semester I

COURSE NO. : VPATH 311
Course Title: Systemic Pathology and Oncology
Credit hour : 3

Digestive system: Pathological conditions of buccal cavity, salivary glands, oesophagus; tympanites, ruminal acidosis, traumatic reticulitis / peritonitis, gastritis, gastric ulcers, enteritis, intestinal obstruction, impaction of caecum, colitis, proctitis, peritonitis, hepatitis, cirrhosis, cholecystitis, cholelithiasis, pancreatitis, and neoplasms.

Respiratory system: Pathological conditions of the upper respiratory tract; pneumonia, pneumonitis, special types of pneumonia, bronchial asthma, pleuritis, atelectasis, emphysema and neoplasms.

Cardiovascular system: Developmental anomalies; cardiac failure, myocarditis, cardiomyopathy, pericarditis, endocarditis, arteriosclerosis, arteritis, phlebitis, and neoplasms.

Hemic and lymphatic system: Pathological conditions of bone marrow, lymph nodes, spleen and thymus; anemia; and neoplasms.

Musculoskeletal system: Introduction, muscular dystrophy, muscular hypoplasia and hyperplasia, muscle glycogenosis, ossification of muscle, steatosis, atrophy, hypertrophy, degeneration and necrosis, nutritional myopathy (white muscle disease), steatites, myositides, equine rhabdomyolysis, fracture of bone, arthritis and neoplasms.

Skin and appendices: Introduction, disorders of epidermis, dermis and subcutis, dermatitis, autoimmune skin diseases, and neoplasms.
Urinary system: Congenital anomalies, glomerulonephritis, interstitial nephritis, pyelonephritis, nephosclerosis, cystitis, urolithiasis, and neoplasms.

Genital system: Congenital anomalies of female and male reproductive organs; cystic ovary, oophoritis, salpingitis, metritis, abortifacient infections, vaginitis, vulvitis, mastitis; orchitis, schirrous cord, gut tie, prostatitis, and neoplasms.

Endocrine system: Pathological conditions of different endocrine glands; Cushing syndrome, goiter, hyperparathyroidism, diabetes mellitus, diabetes insipidus, and neoplasms.

Nervous system: Pathological conditions of brain, spinal cords and peripheral nerves; encephalitis, myelitis, epilepsy, spongiform encephalopathy, and neoplasms.

Organs of special senses: Pathological conditions of eye and ear; conjunctivitis, blepharitis, keratitis, cataract, glaucoma, otitis, otorrhea and neoplasms.

**Department of Pathology**

**Level III Semester I**

**COURSE NO.: VPATH 312**

Course Title: Systemic Pathology and Oncology

Credit hour: 1

Gross and histopathological studies of diseases, disease conditions and neoplasms of different systems using laboratory specimens, histopathological slides, illustrations and transparencies.

**Books recommended (VPATH 311 & 312)**


**Department of Pathology**

**Level III Semester II**

**COURSE NO.: VPATH 321**

Course Title: Pathology of Infectious and Non-infectious Diseases

Credit hour: 2

Pathology and Pathogenesis of the following diseases:

**Bacterial diseases**: Anthrax, black quarter, pasteurellosis, clostridial infections, strangles, glanders, colibacillosis, brucellosis, campylobacteriosis, tuberculosis, paratuberculosis, actinomycosis, actinobacillosis, shigellosis, listeriosis, leptospirosis, dermatophillosis, leprosy.

**Viral diseases**: Rinderpest, hog cholera, peste des petits ruminants, foot and mouth disease, bovine virus diarrhea-mucosal disease complex, ephemeral fever, infectious bovine rhinotracheitis, rabies, pseudorabies, infectious canine hepatitis, canine distemper, pox, papillomatosis, prion diseases.

**Parasitic diseases**: Fascioliasis, stomach worm infection, hookworm infection, stephanofilariasis, ascariasis and other nematodiasis, coccidiosis, toxoplasmosis, babesiosis, trypanosomiasis, trichomoniaisis, hydatidosis and other tapeworm infections, mite infections.

**Fungal diseases**: Rhinosporidiosis, coccidioidomycosis, cryptococcosis, ringworm, aspergillosis, candidiasis, histoplasmosis, blastomycosis.

**Diseases caused by Mycoplasma**: Bovine pleuropneumonia, contagious caprine pleuropneumonia, infectious bovine keratoconjunctivitis, enzootic pneumonia of calves, bovine mycoplasmal arthritis, swine mycoplasmal arthritis and polyserositis.
Diseases caused by Rickettsia: Q fever, salmon disease of dogs and foxes, “Heartwater” of cattle, sheep and goats, anaplasmosis, haemobartonellosis, erythrozoonosis.

Diseases caused by Chlamydia: Psittacosis, sporadic bovine encephalomyelitis, enzootic abortion of ewes, chlamydial abortion in cattle, chlamydial pneumonia of cattle and sheep.

Diseases caused by extraneous poisons: Classification of extraneous poisons on the basis of pathologic features. Pathology of snake venoms, arsenic, urea, oleander, copper, carbon tetrachloride, gossypol, vetch, sulfonamides, selenium, dicoumarin, bracken fern, nitrate, nitrite, kale, rape, mycotoxins, organophosphates, strychnine, lathyrs, coffee senna, coyotillo.

Nutritional and metabolic diseases: Deficiencies of fat soluble and water soluble vitamins; deficiencies of calcium, phosphorous, iron, copper, zinc, iodine; deficiency of protein; ketosis, milk-fever, grass tetany, rickets, osteomalacia, fibrous osteodystrophy.

Books recommended:

Department of Pathology
Level IV Semester I
COURSE NO. : VPATH 411
Course Title: Poultry Pathology
Credit hour : 2

Introduction: Present situation of poultry diseases in Bangladesh

Bacterial diseases: Salmonellosis, colibacillosis, pasteurellosis, infectious coryza, tuberculosis, streptococcosis, staphylococcosis.


Parasitic diseases: Ascaridiasis and other nematodiasis, tapeworm infections, coccidiosis, infestation by ectoparasites.

Fungal diseases: Aspergillosis, thrush, candidiasis.

Mycoplasmal and chlamydial diseases: Avian mycoplasmosis, avian chlamydiosis

Non-infectious diseases: Deficiencies of fat soluble and water soluble vitamins; deficiencies of calcium, phosphorous, copper, zinc; deficiencies of amino acids and protein, calories, water; common vices; mycotoxicoses and other poisonings.

Diseases of complex or unknown etiology: Gout, multicausal respiratory disease, hydropericardium-hepatitis syndrome, ascites and right ventricular hypertrophy, enteric disease complex, spiking mortality syndrome.

Department of Pathology
Level IV Semester I
COURSE NO. : VPATH 412
Course Title: Poultry Pathology
Credit hour : 1

Investigation of poultry diseases; on-farm investigation, post mortem examination & interpretations, and laboratory investigation.

Study of various poultry diseases using laboratory specimens, histopathological slides, illustrations and transparencies.

Books recommended (VPATH 411 & 412)
Clinical Pathology

Introduction: Definition and scope of clinical pathology and necropsy, setting up a clinical pathology laboratory, cleaning and maintenance of glassware and instruments used in clinical pathology, preparation of various buffers, stains, and reagents.

Clinical hematology: Methods of collection of blood, serum and plasma. Routine hematological tests - total erythrocyte count, total leucocyte count, differential leucocyte count, hemoglobin estimation, erythrocyte sedimentation rate, packed cell volume, tests for coagulation disorders; interpretation of hematological findings in animals and birds.

Clinical biochemistry: Tests for heart, muscles, liver, kidney, pancreas and bone function with their interpretations. Clinical tests for urine and their interpretations. Clinical diagnosis of parasitic diseases; Qualitative and quantitative examination of fecal samples. Examination of skin scrapings. Clinical laboratory diagnosis of bacterial and fungal infections: Methods of sample collection, culture, common staining and antibiotic sensitivity tests.

Techniques of Immunodiagnosis: ELISA, agar gel precipitation test, haemagglutination and haemagglutination inhibition tests.

Collection and examination of biopsy materials and clinical cytology. Methods of writing clinical report.

Necropsy

Techniques of postmortem examination of animals and poultry; interpretations of post mortem findings. Selection, collection, preservation and shipment of pathological specimens to the diagnostic laboratories for diagnosis of specific disease or disease conditions.

Methods of disposal of carcasses. Methods of recording of necropsy findings and writing report.

Books recommended:


General Pharmacology:

Introduction and evolution of Pharmacology, drug nomenclature and classification, sources and routes of drug administration, Pharmacodynamics and Pharmacokinetics of drugs, drug dose & dosage, Prescription writing, drug incompatibilities & adverse drug effects.

Chemotherapeutic drugs:

Antibacterial agents: General considerations, sulfonamides, trimethoprim, penicillins, cephalosporins, aminoglycosides, tetracyclines, macrolides, fluoroquinolones and miscellaneous, antibiotics, antifungal and antiviral drug, antiseptics and disinfectants.

Antiparasitic agents: Antinematodal, anticestodal, antitrematodal and antiprotozoal drugs and ectoparasiticides.

Antineoplastic and immunomodulatory agents.
Weights and Measures:
Identification, preparation and study of the actions and dosages of common veterinary drugs. Study the action of drugs on laboratory animals, isolated heart of mammals and amphibians.

Study of the actions of drugs on anesthetized animals.

Books Recommended (VPHA 221 & 222)

Department of Pharmacology
Level-3, Semester-1.

COURSE NO: VPHA-311
Course Title: Systemic Pharmacology
Credit hour: 3


The Heart and circulatory system: introduction, drugs affecting myocardial contractility and rhythmicity, drug affecting heart, vasculature and peripheral circulation.

Respiratory System: Introduction, expectorants, antitussives, bronchodilators, membrane shrinking drugs and respiratory stimulants.


Central Nervous System: Introduction CNS stimulants, depressants, anesthetics –local, regional and general.


Haematopoietic System: Introduction, anti-anemic, haemostatic, and anti-coagulant drugs.

Dermatologic and Ophthalmic Pharmacology: Introduction, drugs affecting skin, mucous membranes, ears and eyes.

Prophylactic Pharmacology: Introduction, vaccine, antisera, and diagnostic agents.


Books Recommended
COURSE NO: VPHA-512
Course Title: Clinical Pharmacology and Pharmacy.
Credit hour: 1

Collection, preparation, packaging and preservation of solution, suspension, capsules, tablet, paste, emulsion, ointment, etc.. Compounding and dispensing of various preparations.

Pharmaceutical dosage forms and packaging.

Collection, identification and use of common indigenous medicinal plants.

Techniques used for the assessment of antibiotics, anthelmintics, anti-inflammatory drugs, antiseptics and other common drugs. Clinical aspects of rational safe and effective drug therapy. Drug therapy of individual disease, introduction of new medicines.

Books Recommended

Department of Pharmacology
Level-4, Semester-2.
COURSE NO: VPHA-321
Course Title: Toxicology
Credit hour: 3

Introduction, different areas of toxicology, toxicological terminology. Classification, metabolism and mode of action of poisons, factors altering the action of poisons, common causes, diagnosis and general treatment of poisoning.

Chemical and Phytotoxicology: Study of sources, toxicity, mechanism of toxic action, symptoms, diagnosis, treatment and prevention of the following:
(i) Inorganic poisons: Acids and alkalis, urea, antimony, arsenic, carbon monoxide, sodium chloride, copper, halogen compounds, lead, mercury, molybdenum, selenium and zinc.
(ii) Organic poisons: Anesthetics, sympatho and parasympathomimetics, anthelmintics, antibiotics and sulfonamides.
(iii) Pesticides: Botanical insecticides, organochlorine, organophosphate and organocarbamate compounds, fungicides, herbicides, rodenticides and acaricides.

Environmental Toxicology:
Various agents causing environmental pollution, i.e. soil, air and water pollution. Food additives and contaminants. Drug and chemical residues in the edible tissues of animals. Radiation and radioactive materials. Green house effects.

Miscellaneous Poisons: Plants and chemical producing teratogenic, mutagenic, carcinogenic and allergic conditions

Department of Pharmacology
Level-3, Semester-2
COURSE NO: VPHA-322
Course Title: Toxicology
Credit hour: 1

Identification and study of common poisonous plants. Collection and sending of materials for toxicological analysis. Laboratory diagnosis of poisons-volatile, non-volatile and metallic poisons including cyanides, nitrate, arsenic and mercury etc.

Chemical antagonism: Arsenic and dimercaprol (BAL)/sodium thiosulphate.

Books Recommended: (VPHA-321 & 322)

Department of Medicine
COURSE NO. VM 311
Course Title: Clinical Methodology
Credit hour: 2

A. Introduction and Clinical examination
   b) Introduction to different techniques/methods (general and special) of clinical examination of animals, History taking, examination of the environment and examination of the animal. General examination – distant and close examination, physical examination of body regions and systems, Animal restraint – objective and methods of restraint. Clinical signs – Definition, classification, methods of detection and identification of clinical signs of diseases of different organ-systems of animals. Interpretation of significant clinical findings for diagnosis. Physical examination findings of clinical specimens.

B. Diagnosis and treatment
   Definition and types of diagnosis, principles of diagnosis, principles and basis of different types of diagnosis. Methods and steps of diagnosis. Indications and limitations of field and laboratory diagnosis.
   General principles of treatment, definition and scope of different types of treatment, factors of consideration in the treatment of food and non-food animals. Principles of selection of drugs and determination of dose, route, frequency and duration of treatment. Alternative medicine used in clinical and population veterinary practices.

   General systemic states – Disturbances of appetite, food intake and nutritional states-ill thrift, pica; stress, septicemia, hypothermia, hyperthermia, fever, toxemia, shock. Dehydration, electrolyte and acid-base imbalance.

Department of Medicine
COURSE NO. VM 312
Course Title: Clinical Methodology
Credit hour: 1

Maintenance of records of everything done in the practical sessions in a practical note book to be checked and signed by teacher(s) concern.

1. Introduction: Scope of veterinary hospital and clinical practice, requirements and responsibility of veterinary clinician.
3. Demonstration of clinical instruments: Diagnostic (including animal restraint) and therapeutic instruments.
4. Demonstration of general (including modified forms) and special physical examination techniques used in different organ-systems of domestic animals (healthy).
5. Handling of clinical cases: General principles and procedures of clinical / physical examination in domestic animals. Demonstration of condition of distant inspection and physical examination.
6. General principles and procedure of clinical history taking and distant inspection. Demonstration of demeanour and physical condition of animals.
8. Clinical specimens: Demonstration of the methods of collection, physical examination, preservation and dispatch of specimens (feces, urine, blood, rumen fluid, abomasal fluid, milk, skin scrapings, plasma, serum, swabs, smears etc) to the laboratory.
10. Transfusion techniques: Clinical practice on fluid and electrolyte, and blood transfusion in farm animals.
11. Demonstration of drugs, dispensing and prescription writing: Principles and procedures.
Books Recommended (VM 311 & 312)

8. সাহে, এম. এ। (২০০১), পত্ত প্লান ও চিকিৎসাবিদ্যা, বেল প্রকাশনা, অঃ ০৬ রাজকীয়, ময়মনসিংহ।

**Department of Medicine**

**COURSE NO. VM 323**

Course Title: Systemic Diseases of Farm Animals  
Credit hour : 3

A. Diseases of digestive, respiratory and urinary organ-systems

General principles of dysfunction and manifestations, diagnosis and treatment of diseases of digestive, respiratory and urinary systems of domestic ruminants, horses and swines.

Definition, causes, pathophysiology, pathogenesis, clinical characteristics (signalment, anamnesis, nature of onset, clinical signs, course and severity, physical findings of specimens), presumptive diagnosis, prognosis, conservative treatment and nature of response and advice on general diseases (mentioned below) of digestive, respiratory and urinary organs-systems of domestic ruminants, swines and horses.

2. Diseases of stomach and intestine : Equine and bovine colic, indigestion, rumenal bloat, impaction of omasum and abomasums, abomasal displacements-left, right, torsion, enteritis, dietary diarrhea and acute intestinal obstruction.
3. Disease of liver and peritoneum : Hepatitis, hepatomegaly, jaundice, peritonitis.

B. Diseases of other organ-systems

General principles of dysfunction and manifestations, diagnosis and treatment of diseases of cardiovascular, nervous, musculoskeletal and integumentary systems of farm animals.

Definition, causes, pathogenesis and pathophysiology, clinical characteristics, presumptive diagnosis, prognosis, conservative treatment and nature of response and advice on important general diseases (mentioned below) of other organ-systems – cardiovascular, hemopoietic and lymphatic, nervous and musculoskeletal systems, skin, udder, eye and ear of domestic ruminants, swines and horses.

1. Diseases of hair, wool, follicles, skin, coat and subcutis : Pityriasis, alopecia, hypotrichosis, seborrhea, folliculitis, hyperkeratosis, parakeratosis, pachyderma, urticaria, photosensitization, dermatitis and dermatosis, angioneurotic edema, subcutaneous emphysema, anasarca, subcutaneous cysts.
2. Diseases of udder and teats : Teat papilloma, bovine ulcerative mammmillitis, udder impetigo, chaps, theilitis, udder edema, blood in the milk, agalactia.
3. Diseases of eye and ear : Keratitis and conjunctitis, otitis externa/otorrhea.
4. Diseases of cardiovascular, hemopoietic and lymphatic systems : Heart failure (acute heart failure, congestive heart failure), myocarditis and endocarditis, pericarditis and congenital defects, edema, anemia, lymphadenopathy, splenomegaly.
6. Diseases of musculoskeletal system : Myositis and myopathy, myasthenia, osteodystrophy and osteomyelitis, arthropathy and arthritis.

**Department of Medicine**

**COURSE NO. VM 324**

Course Title: Systemic Diseases of Farm Animals  
Credit hour : 1

1. Handling of clinical cases : Clinical/physical examination, non-laboratory field-based presumptive diagnosis, prognosis and conservative curative treatment of general diseases, and advice for restoration of health in individual sick farm animals (domestic ruminants, swines and horses).
2. Collection, physical examination, preservation and dispatch of clinical specimens to respective laboratories of the Faculty of Veterinary Science.
3. Recording of at least 30 clinical cases with post-treatment evaluation and interpretation in a note book (approved format of the Department concerned) to be checked and signed by teacher(s) concerned.

**Books Recommended (VM 323 & 324)**

9. সামাদ,এফ,এ,(২০০১). পশু পালন ও চিকিৎসাবিদ্যা, দেশ প্রকাশনা, নং ০৮ বাকৃব, ময়মনসিংহ।

**Department of Medicine**

**COURSE NO. VM 421**

Course Title: Infectious Diseases of Farm Animals
Credit hour: 3

**A. Diseases of Cattle and Buffaloes**

Definition, causes, pathophysiology/pathogenesis, clinical characteristics (signalment, anamnesis, nature of onset, clinical signs, course and severity, physical findings of specimens), presumptive diagnosis, prognosis, conservative treatment and nature of response and clinical advice on important infectious and parasitic diseases (listed below) of domestic cattle and buffaloes of Bangladesh.

1. Bacterial diseases: Mastitis, anthrax, pasteurellosis (pneumonic, septicemic-HS), colibacillosis, salmonellosis, clostridial diseases (tetanus, black leg, black disease, bacillary hemoglobinuria, malignant edema, botulism, enterotoxemia), actinomycosis, actinobacillosis, tuberculosis, Johne’s disease, navel ill, posthitis, contagious bovine pyleonephritis, brucellosis, vibriosis, leptospirosis, listeriosis, foot rot, dermatophiosis, infectious bovine keratoconjunctivitis.
2. Mycoplasmal, rickettsial, chlamydial and fungal diseases: Contagious bovine pleuropneumonia, anaplasmosis, Q-fever, tick borne fever, contagious ophthalmia, contagious agalactia, rhinosporidiosis, dermatphytosis, Degnala disease, cryptococcus, candidiasis.
3. Viral diseases: Foot and mouth disease, ephemeral fever, rabies, rinderpest, bovine virus diarrhea, infectious bovine rhinotracheitis, rota virus infection, bovine malignant catarrhal fever, winter dysentery, papillomatosis, cowpox, buffalopox.
5. Helminth diseases: Hydatid disease, lungworm disease, fascioliasis, intestinal amphistomiasis, schistosomiasis (nasal and intestinal), ascariasis, strongyloidosis, stephanofilariasis, parasitic gastro-enteritis, tape worm infection.
6. External parasitic infestation: Lice, tick and mite infestations.

**B. Diseases of Goats, Sheep, Swines and Horses**

Definition, causes, pathophysiology/pathogenesis, clinical characteristics (signalment, anamnesis, nature of onset, clinical signs, course and severity, physical findings of specimens), presumptive diagnosis, prognosis, conservative treatment and nature of response and clinical advice on important infectious and parasitic diseases (listed below) specific to domestic goat, sheep, swine and horse in Bangladesh.

1. Diseases of sheep and goat: Enterotoxemia, tetanus, caseous lymphadenitis, parasitic gastroenteritis, parasitic oitis, fascioliasis, cerebral and extraneural cenurosis, tapeworm infection, tick pyemia, external parasitic infestation (sheep ked infestation, different types of mange), blue tongue, contagious ecthyma, PPR, louping ill, scrapie, sheeppox, goatpox, pulmonary adenomatosis and ovine progressive pneumonia.

**Department of Medicine**

**COURSE NO. VM 422**

Course Title: Infectious Diseases of Farm Animals
Credit hour: 1
1. Handling of clinical cases: Clinical/physical examination, non-laboratory presumptive diagnosis, prognosis and conservative treatment of special diseases and clinical advice for restoration of health in individual sick farm animals (domestic ruminants, swines and horses).
2. Collection, physical examination, preservation and dispatch of clinical specimens to respective laboratories of the Faculty of Veterinary Science.
3. Recording of at least 30 clinical cases with post-treatment evaluation and interpretation in a notebook (approved format by the Department concern) to be checked and signed by teacher(s) concern.
4. Visit to Rajarbagh police horse farm, camel farm (Dhaka), Savar dairy farm during Thursdays using ambulatory clinic of BAU vet. clinic.

Books Recommended (VM 421 & 422)

10. সামাল, এম,এ, (২০০২)। পশু পালন ও চিকিৎসাবিদ্যা, নেশ রাক্ষসা, নং ০৮ বারুকি, মজমুলসিংহ।

Department of Medicine

COURSE NO. VM 413

Course Title: Metabolic and Nutritional Diseases of Farm Animals
Credit hour: 2

Metabolic diseases
Definition of metabolic and production diseases and their differences, Compton metabolic profile test, differential diagnosis of common causes of recumbency in parturient adult cattle, Milk fever, downer cow syndrome, bovine ketosis, pregnancy toxemia, fat cow syndrome, acute hypokalemia in cattle, neonatal hypoglycemia, grass tetany, lactation tetany, hypophosphataemia, post-parturient hemoglobinuria, azoturia.

Nutritional diseases
Protein-energy deficiency diseases, vitamin-mineral deficiency diseases (vitamin A, D, E, B12, calcium, phosphorus, magnesium, cobalt, copper, iodine, iron, manganese, zinc, selenium deficiency diseases), rickets, osteomalacia, osteodystrophia fibrosa.

Diseases caused by chemicals, poisons, toxins
Organophosphorus and carbamates poisoning, chlorinated hydrocarbon poisoning, nitrate and nitrite poisoning, hydrocyanic acid poisoning, arsenic and lead poisoning, urea poisoning, oxalate poisoning, poisoning by anthelmintics, snake bite, bee stings, tick paralysis.

Diseases caused by physical agents
Lightning stroke and electrocution, burns and scalds, yoke gall, brisket disease.

Books Recommended
9. সামাল, এম,এ, (২০০২)। পশু পালন ও চিকিৎসাবিদ্যা, নেশ রাক্ষসা, নং ০৮ বারুকি, মজমুলসিংহ।

Department of Medicine
A. Small Animal Medicine

Definition, causes, pathophysiology, pathogenesis, clinical characteristics (signalment, anamnesis, nature of onset, clinical signs, course and severity, physical findings of specimens), presumptive diagnosis, prognosis, conservative treatment and nature of response and clinical advice on the following important general and special diseases of pet dogs and cats in Bangladesh.

General diseases
1. General systemic states--Hyperthermia, hypothermia, toxemia, weakness, syncope, obesity, cachexia.
2. Digestive disorders-anorexia, inappetance, polyphagia, ptyalism, vomiting, diarrhea, constipation, dysentery, gastroenteritis.
3. Respiratory disorders – sneezing, nasal discharge, coughing, tachypnea, dyspnea.
7. Endocrine and musculoskeletal disorder—Acromegaly, diabetes, hypothyroidism, lameness, swollen joint.
8. Diseases of eye and ear.
9. Skin diseases: alopecia, pruritus, skin lesions, erosive and ulcerative dermatitis.

Special diseases
2. Bacterial diseases: Salmonellosis, campylobacteriosis, tuberculosis, pseudotuberculosis, brucellosis, leptospirosis, actinomycosis, tetanus, botulism, Tyzzer’s disease, tularemia, streptococcosis, cat scratch disease, bubonic plague.
3. Fungal diseases : Dermatophytosis, candidiasis, moniliasis, histoplasmosis, cryptococcosis, aspergillosis.
4. Parasitic diseases : Protozoan diseases – Coccidiosis, cryptosporidiosis, amebiasis, giardiasis, toxoplasmosis, babesiosis, trypansomiasis, leishmaniasis, sarcozystosis, Helminth diseases – Heart worm disease, ascariasis, hookworm disease, strongyloidiasis, tape worm disease, whipworm disease, giant kidney worm disease, esophageal and stomach worm disease, trichinellosis, External parasitic infestation – Lice, tick, flea and mite infestations.
5. Non-infectious diseases : a) Nutritional deficiency diseases, b) Diseases caused by physical and chemical agents, immunological disorders and cancer.

B. Zoo and Laboratory Animal Medicine

1. Introduction, history and scope of Zoo and Laboratory Animal Medicine. Requirements for zoo veterinarians, Definition of related terms. Epidemiological significance of zoological gardens.
2. Animal status in different zoo in Bangladesh, ethology (behaviour) and stress in zoo animals and birds.
3. Restraint - different methods and adverse effects of restraint.
4. Principles of diagnosis of diseases of zoo and laboratory animals - dispatch of samples to the laboratory and laboratory methods of diagnosis.
5. Health management of different zoo and laboratory animals.
6. Classification, biological characteristics, feeds and feeding, restraint and handling and important diseases of common species of zoo animals and birds of the following orders, Aves, Reptiles and mammals (Marsupialia, Edentata, Chiroptera, Non-human primnates, Lagomorpha, Rodentia, Carnivora, Proboscidea, Perissodactyla and Artiodactylia).
7. Principles of nutrition and nutritional deficiency diseases in zoo animals and birds with their treatment and prevention.
8. Zoonotic diseases of zoo and laboratory animals and birds and their prevention and control.

Department of Medicine

COURSE NO. VM 412
Course Title: Small, Zoo and Laboratory Animal Medicine
Credit hour: 1

Small Animal Medicine
1. Introduction and requirements of small animal clinic and responsibilities of the small animal practitioners.
2. Methods of restraining of dogs, cats and zoo and laboratory animals and birds.
3. Methods of clinical diagnosis of diseases of dogs and cats- History taking, distant inspection and physical techniques, clinical examination of different body regions and different systems and organs of small animals
4. Methods of laboratory diagnosis-collection, physical examination, preservation and shipment of stools, urine, blood, skin scrapings, smears, swabs and edematous fluid. Diagnostic imaging techniques
5. Demonstration and dispensing of drugs and their doses, route of administration, duration of treatment and adverse drug reactions in dogs and cats.
6. Recording of clinical cases of dogs and cats and their prescription writing, post-treatment evaluation and interpretation.
7. Field trips to the Central Veterinary Hospital, Dhaka and other private small animal clinic for practical classes.

**Zoo and Laboratory Animal Medicine**
1. Requirement of zoo veterinarians.
2. Methods of restraining of zoo and laboratory animals and birds.
3. Demonstration of drugs and vaccines used in zoo and laboratory animals with their dose and route of administration.
4. Methods of clinical examination, collection and dispatch of specimens to the laboratory for confirmation of diagnosis and treatment of sick zoo and laboratory animals and birds.
5. Requirements and planning for establishing an ideal zoological garden and laboratory animal house.
7. Provision for funds and transport for practical classes in zoological garden in Dhaka zoo and students should prepare and submit the report on practical classes held in zoo during final examination.

**Books Recommended (VM 411 & 412)**

**Department of Medicine**

**COURSE NO. VM 512**
Course Title: Clinics (Medicine)
Credit hour : 1
1. Handling of clinical cases : Clinical/physical examination, non-laboratory field-based presumptive diagnosis, prognosis and conservative treatment of both general and special diseases and clinical advice for restoration of health in individual sick animals and birds attended at Veterinary Clinic of BAU.
2. Collection, physical examination and dispatch of specimens to the laboratory.
3. Preparation of a note book which will include a) recording of 30 clinical cases with post-treatment evaluation and interpretation (approved format prescribed by the department concern). The note book is to be checked and signed by teacher(s) concern.

**Books Recommended**
6. Samad, M.A. (২০১১), পত্র প্রশাসন ও চিকিৎসাসাধনা, নেশ একাডেমী, নং ০৮ বাজার, ময়মনসিংহ।

**Department of Medicine**

**COURSE NO. VM 321**
Course Title: Epidemiology and Preventive Medicine
Credit hour : 3
A. Principles and Methods of Epidemiology and Ecology

B. Preventive Veterinary Medicine


List A diseases: Mastitis, salmonellosis, colibacillosis, clostridial diseases, parasitic, metabolic & nutritional diseases.

List B diseases (Transboundary Animal Diseases, TAD): Foot and mouth disease, PPR, rinderpest, sheep and goat pox, contagious bovine pleuropneumonia, hog cholera, swine fever, swine vesicular disease, vesicular stomatitis, lumpy skin disease, blue tongue, rift valley fever, African horse sickness.

List C diseases: Anthrax, dermatophilosis, hemorrhagic septicemia, babesiosis, theileriosis, rabies, Johne’s disease, tuberculosis, brucellosis, leptospirosis, campylobacteriosis, infectious bovine rhinotracheitis, anaplasmosis, screw-worm diseases heartwater, enzootic bovine leukosis, bovine spongiform encephalopathy (Summary of List B diseases in cattle of international trade significance).

Animal health maintenance – general principles, significance of optimum animal health in optimum production in national and international livestock trade perspectives. General production medicine - general principles, mathematical techniques used in production medicine, record systems and herd monitoring, culling and improvement. Special production medicine - herd health management programs, environmental, disease and dietary management of food animals: dairy cattle, calves and replacement heifers, meat cattle, goat, sheep and swine herds.

**Department of Medicine**

**COURSE NO. VM 322**

Course Title: Epidemiology and Preventive Medicine

Credit hour: 1

**Epidemiology**

1. Epidemiologic explanatory variables: Identification and procedure of measurement in population.
2. Development of questionnaires for various epidemiologic studies, surveys, surveillance and monitoring. Pre-testing of questionnaires in population, methods of collection of data.
3. Statistical analysis of data: Demonstration of association and identification of risk factors.
5. Epidemiologic data management and presenting numerical data, Measurement of population impact and transmission of disease: Procedure of computation.
6. Diagnostic testing for identification of disease process and subclinical disease.
7. Collection and analysis of ecologic data: Demonstration of ecological risk factors of disease in environment of the population of animals and birds.

**Preventive Medicine**

1. Development of questionnaires collection of disease and health data from population.
2. Statistical analysis for identification of risk factors.
4. Demonstration of biosecurity, disease security, hygienic and sanitary measures.
5. Disease management programs in population: Vaccination and disease control programs planning, execution and evaluation.

**Books Recommended (VM 321 & 322)**

A. Clinical Poultry Medicine

Importance of health and disease management in poultry production; Principles of presumptive diagnosis of disease in poultry population – holistic and clinical field data; Source of infection; Clinical signs of poultry diseases – definition, classification, meanings and interpretation for presumptive diagnosis of diseases.

Important general and special poultry diseases (listed below) – definition, causes, pathophysiology, pathogenesis, clinical characteristics (signalment, anamnesis, nature of onset, clinical signs, course and severity, physical findings of specimens), mass diagnosis, mass treatment and prognosis.

B. a) Preventive Poultry Medicine

Objectives and significance of preventive poultry medicine in subsistence and commercial poultry production of Bangladesh; concepts of biosecurity, disease security and flock immunity; Holistic characteristics (frequency, distribution, ecology, temporal patterns and trends, risk factors, economic impact) and management (prevention, control and eradication of important general and special diseases (listed below) in subsistence and commercial poultry populations of Bangladesh; handling of disease outbreaks; disinfection and vaccination in disease control.

b) Production Poultry Medicine

General poultry production medicine – General principles of flock health, mathematical techniques used in flock health management, record systems and flock monitoring, culling and improvement. Special poultry production medicine – planning and evaluation of poultry flock health management programs (environmental, disease and dietary management) for commercial layer, broiler, cockerel and quails, subsistence chickens and ducks; hatchery and hatching eggs management.

*Poultry Diseases

General Diseases : Crop impaction, enteritis, stunted chick disease, bumble foot, round heart disease, endocarditis, nephrosis and gout, egg bound, abnormal eggs, egg peritonitis, false layer, internal layer.


Parasitic diseases : Nematode, cestode and trematode infections, avian coccidiosis, histomoniasis, trichomoniasis, leucocytozoonosis, avian malaria, hemoproteus infections, cryptosporidiosis, external parasitic infestations (flea, lice, tick, mite infestations).

Metabolic, nutritional, chemical and physical diseases : Protein, carbohydrate, fat, vitamin and mineral deficiency diseases. arsenic, calcium, copper, lead, nitrate, bicarbonate, sodium chloride, potassium permanganate, organic insecticides, chlorinated hydrocarbons and organophosphorus poisoning, mycotoxices, ascites and edema, heat stress, ammonia blindness, cannibalism, egg eating, smothering, cage layer fatigue, acute death syndrome in broiler.

Hatchery and egg borne diseases, diseases of public health significance.

Department of Medicine

COURSE NO. VM 423

Course Title: Poultry Medicine

Credit hour : 2

1. Demonstration of clinical signs of poultry diseases in population level.
2. Clinical specimens : Methods of collection, physical examination, preservation and dispatch of specimens to the laboratory.
3. Methods of mass diagnosis using clinical and holistic field data of disease in population.
4. Methods of administration of drugs in mass treatment, and vaccination.
5. Epidemiologic investigation of disease : Development of questionaires for collection of data on poultry population characteristics and transmission of disease using principles and methods of descriptive and explanatory epidemiologic studies.
6. Procedure of measurement of poultry health and disease variables.
7. Statistical analysis of data, demonstration of association and identification of risk factors of poultry health and disease.
10. Demonstration of materials used in preventive and control measures and methods of administration in poultry.
11. Development of questionnaires for collection of health and production data from subsistence and commercial poultry flocks.
12. Procedure of measurement of poultry health and production variables and collection of data.
13. Analysis of data to determine shortfalls and demonstration of shortfalls, Principles and procedure of eliminating shortfalls in commercial flocks.
14. Profit oriented flock health program: Planning, execution and evaluation for various commodities of poultry-layer, broiler, chicks, cockrel, etc.
15. Field trips to public and private poultry farms for practical exposure.

Books Recommended (VM 423 & 424)

Department of Medicine
Course Title: Forensic Medicine, Jurisprudence and Animal Welfare
Credit hour: 2

A. Forensic Medicine, Jurisprudence
Introduction and definition of Veterinary Forensic Medicine and Jurisprudence; aims, scope, uses and branches of forensic medicine: difference between forensic medicine and jurisprudence; legal system – criminal courts and powers; vetero-legal wounds – classification and description of vetero-legal wounds, differences of different wounds, determination of age of injury, vetero-legal importance of wound healing; common frauds in the sale of livestock and its products; Common offences against animals – bestiality, maiming, mischiefs and mischievous killing (poisoning, slaughtering, violence, starvation, strangulation and drowning); causes of sudden death; accidental deaths – lightning stroke and electrocution; Examination of live and dead animals in criminal cases and submission of vetero-legal specimens; Vetero-legal report writing; Vetero-legal evidence – hints for giving evidence and witness; Veterinary legislations – Bangladesh Animal Disease Act 2005, Bangladesh Animal and Animal Product Quarantine Act 2005, Cattle Trespass Act 1871, The Livestock Importation Act 1898, Prevention for Cruelty to Animals Act 1890, Bioterrorism Act 2002, Poisons Act 1919, Dangerous Drugs Act 1930.. Organization of veterinary service in Bangladesh – nature and scope of veterinary services; Professional conduct, professional malpractices, liability, veterinary ethics, animal insurance.

B. Animal welfare
Introduction: Definition, objectives, concepts, indications and public perceptions. Causes of welfare problems of the following animals: Draught and farm animals, pet and entertainment animals, laboratory, wild and captive animals, pet birds and poultry. Control of animal welfare problems-Animal welfare regulations.

Books Recommended

Department of Surgery and Obstetrics
Level 4 Semester I

31
**COURSE NO : VSO 411**

**Course Title : Anaesthesiology**
Credit hour : 3

Definition of common terms, general consideration for anaesthesia, classification of anaesthesia and anaesthetics, mode of action of different anaesthetics, stages of anaesthesia.

General principles of local anaesthetics, general pharmacology of inhalation and injectable anaesthetics, principles of preanaesthetic examination and preparation of animal

Principles of sedation and premedication: Indications, agents used and their doses in different species.

Muscle relaxants: Drugs used and their doses in various species.

Local and regional analgesia in various species: Topical analgesia, paravertebral block, field block, epidural, cornual, auriculopalpebral, supra-orbital, mandibular, infra-orbital, planter, peroneal, pudic nerve block, intravenous regional analgesia

General anaesthesia and anaesthetics:

Injectable agents - Chloral hydrate, barbiturates, dissociative agents, steroid and other agents.

Inhalation agents – Chloroform, diethyl ether, halothane, methoxyflurane, enflurane, isoflurane, nitrous oxide, and cyclopropane

Apparatus used for administration of anaesthetics

Anaesthesia of dog, cat, sheep, goat, cattle, horse

Anaesthesia of zoo and laboratory animals and birds.

Anaesthesia for obstetrical practice in various species of animals

Postanaesthetic intensive care of animals

Hazards of anaesthesia and their management.

Euthanasia: Indications, various methods and agents used.

**Books Recommended**


Textbook of Veterinary Anesthesia. 1971. Soma, L.R., The Williams & Wilkins Company, Balt

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**Department of Surgery and Obstetrics**

**Level 3 Semester II**

**COURSE NO : VSO 321**

**Course Title : General Surgery**
Credit hour : 3

Introduction, definition of common surgical terms and methods of therapy.

**Principles of surgery:**

Preoperative consideration of animals, Inflammation, suppuration and abscess formation, affection of uropegeal gland in bird, contusions, fibrosis and sclerosis, wounds, classification, characterization and treatment of wounds, healing of wounds, complications of wound healing, ulceration, necrosis, gangrene, sinus, fistula, cysts, tumors, haematoma, lymphangitis, oedema, emphysema, physical lesions, affections of joints, fractures and repair of bones, complications of fractures, yoke gall, haemorrhage and haemostasis, burns and scalds, frost bite, shock and its management, cryosurgery, paracentasis, asepsis and antisepsis.

**Surgical affections of tissues:**

Aetiology, classification, symptoms, diagnosis, prognosis and treatment of skin and subcutaneous connective tissues, arteries, veins, lymphatics, nerves.

**Surgical affections causing lameness:**

Definition, classification, aetiology, clinical signs, diagnosis, prognosis and treatment of different affections causing lameness.

**Fluid therapy:**

Indications, different types of fluids used, assessment of fluid deficit, administration of fluids, electrolyte and acid-base balance, transfusion of blood and blood plasma.
General considerations for surgery
Proficiency in operative surgery, clinical examination of the patient, surgical anatomy, preparation of patient, restraint of animals, identification and sterilization of instruments, dressing, bandaging, sutures and suture materials, different types of knots, operative technique, haemostasis, practice of fluid therapy and blood transfusion.

Passing of stomach tube, probang and catheter in domestic animals, nerve blocking, parenteral injection of drugs, sera and vaccines, diagnosis of lameness, common minor operations in domestic animals, paracentesis abdominis in bovine.

Books Recommended (VSO 321 & 322)

Ophthalmic and aural surgery:
Surgical anatomy of the eye and ear and their examination.
Surgical affections of eye and ear: Ectropion, entropion, conjunctivitis, dacryocystitis, keratitis, corneal ulcer, staphyloma, corneal opacity, cataract, glaucoma, uveitis, dermoid cyst, parasite in the eye, otitis, aural hematoma.

Nasal surgery:
Epitaxis, hemoptysis, foreign bodies and parasite in the nostrils, pus in the antrum, empyema of sinus.

Dental surgery:
Parrot mouth, pig mouth, shear mouth, sharp mouth, dental tarter, dental caries, pyorrhoea, dental fistula, dentigerous cysts, extraction of teeth, dental abscess, epulis.

Gastrointestinal surgery:
Salivary mucocele, ranula, sialoliths, chocking, gastro-oesophageal reflux, hematemesis, foreign body, oesophageal stricture, gastric dilation-torsion syndrome, delayed gastric emptying, traumatic reticuloperitonitis, bloat, tympany, impaction, abomasal displacement and torsion, intestinal obstruction, intussusception, volvulus, caecal dilatation, various hernias, rectal prolapse, atresia ani, atresia recti, atresia coli, rectal prolapse, intestinal anaestomosis, anal sac disease, cholelithiasis, peritonitis.

Urogenital surgery:
Obstruction of urethra, ureolithiasis, various types of calculi, rupture of the bladder and urethra, retention of urine, urinary fistula, castration in different animals, cryptorchidism, ectopic testis, hydrocele, scrotal ablation, phimosis, paraphimosis, penile fracture, persistent frenulum, hypospadias, fracture of the os penis, canine vinereal granuloma, hyperplasia of the prostate gland, neoplasms and other diseases, caesarean section, ovariohysterectomy in bitch, uterine and vaginal prolapse, persistent hymen.

Udder and teat:
Affection of udder and teats: Imperforate teats, teat fissure, obstruction of the teat canal, teat fistula, papilloma, contusions, open wounds, gangrenous mastitis, abscess, tumor, ulcers, botryomycosis.

Department of Surgery and Obstetrics
Level 5 Semester I
COURSE NO : VSO 518
Course Title : Operative Surgery
Credit hour : 1

Anaesthesia and analgesia related to specific operations.

Amputation of tail, digit, declawing, aural resection in dogs, entropion and ectropion operation, enucleation of eyeball, abscess, castration, caponization, ovariohysterectomy, ceasarean section, urethrotomy, cystotomy, ventriculochordectomy (debarking), tracheotomy, oesophagotomy, gastrotomy, enterotomy, enterectomy, intestinal anastomoses, spleenectomy, cholecystectomy, trephining of sinus, ligation of Stenton’s ducts, opening of guttural pouch, roaring operation, penis deviation, vasectomy, amputation of penis, Caslick’s operation, trocarization, tenotomy, nephrectomy.

Books Recommended (VSO 517 & 518)

Department of Surgery and Obstetrics
Level 4 Semester II
COURSE NO : VSO 423
Course Title : Radiology and Soundness
Credit hour : 2

Radiology

Introduction, definition of common terms, properties of X-rays, quality of radiograph, X-ray machine, X-ray accessories, production of X-ray, X-ray imaging, exposure factors, contrast media for different body systems, positioning of animals, taking of radiograph, X-ray dark room, processing of X-ray films, radiographic artifacts, interpretation of radiographs, radiation hazards and safety, scattered radiation, diagnostic radiography and fluoroscopy, principles of endoscopy and ultrasound technique, radiodiagnosis and radiotherapy in veterinary practice, scope of nuclear medicine.

Soundness:

Introduction, causes of unsoundness, unsoundness due to hereditary vices and acquired diseases, different breeds of animals and birds, conformation, colour and markings, dentition and aging, signs of health, examinations for soundness, writing of certificate, shoeing of animals.

Department of Surgery and Obstetrics
Level 4 Semester II
COURSE NO : VSO 424
Course Title : Radiology and Soundness
Credit hour : 1

Radiographic equipment and accessories, contrast media, preparation of animals and birds for taking radiographs, estimation of exposure factors, methods of taking radiographs of different organs, processing of exposed X-ray films, storage of radiograph, viewing of radiograph, use of infrared and ultraviolet rays, radiographic artifacts and interpretation of radiographs, radiographic safety measures, management of X-ray film and dark rooms, method of examination of animals and birds for soundness and certificate writing, shoeing of animals.
Books recommended (VSO 423 & 424)


Department of Surgery and Obstetrics
Level 5 Semester I
 COURSE NO : VSO 514 
Course Title : Clinics (Surgery) 
Credit hour : 1

Clinical diagnosis and treatment of surgical diseases and disorders in animals and birds at the veterinary clinic, ambulatory surgical services at various farms and field stations, clinical practices of surgical cases at various government and private veterinary hospitals, clinics and zoo.

Books Recommended:
Surgical Techniques in Experimental Farm Animals. 1995. F.A. Harrison Blackwell Publishing

Department of Surgery and Obstetrics
Level 4 Semester I
 COURSE NO : VSO 413 
Course Title : Obstetrics and Gynaecology 
Credit hour : 3


Department of Surgery and Obstetrics

Books Recommended (VSO 413 & 414)

Department of Surgery and Obstetrics
Level 4 Semester II
COURSE NO: VSO 425
Course Title: Andrology and Artificial Insemination
Credit hour: 2

Books Recommended (VSO 425 & 426)
Diagnosis and treatment of genital diseases of male and female animals at the clinics. Treatment of gynaeco-obstetrical and infertility related cases at the clinics and field conditions. On farm practice of reproductively health management, mastitis diagnosis, treatment and udder health management.

Books recommended
COURSE NO. : ABG 330
Course Title: Genetics and Animal Breeding
Credit hour : 1

Exercises on segregation, gamete formation, gene combination, Mendelian ratios in the formation of genotypes, probability, Chi-square test, estimation of repeatability and heritability.

Books Recommended (ABG 329 & 330)
Breeding and improvement of Farm Animal (7th edition). Warwick, E.J. and J.E. Legtes.

Department of Animal Nutrition
Level -2, Semester II
COURSE NO. :AN 223
Course Title : Animal Nutrition
Credit hour : 3

Definition & scope of nutrition, its relation with other discipline of Science, history of it development. Classification of food nutrients and their functions.

Metabolic functions & deficiency of minerals & Vitamins.
Digestion & utilization of carbohydrate, Protein, & fat in monogastric and polygastric animals
Feeding standards.
Feed stuffs & their classification. Balancing ration for different species of animals.
Digestibility and nutrient value of different feed.
Nutrients and feed requirement in animals at various stages of growth reproduction and production.

Feeding animals and factors affecting food

Department of Animal Nutrition
Level -2, Semester II
COURSE NO. :AN 224
Course Title : Animal Nutrition
Credit hour : 1

Processing & preparation of feed samples for nutritional analysis.
Proximate analysis of feed stuffs.
Identification of common feed stuffs.
Feed formulation for different ages/stages of animals.

Books Recommended (AN 223 & 224)

Department of Animal Science
Level -1, Semester- 1

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Scientific and professional terms: Horse, Cattle, Buffalo, Sheep, and goat.

Common breeds of livestock: Common breeds of livestock, their important characteristics and adaptive ability with special emphasis on horse, cattle, buffalo, sheep, and goat.

Housing: Economic importance of housing. Objectives and principles of housing livestock. Selection of site for livestock farms. Types and system of housing for livestock.

Management of livestock: Different management practices of livestock. Care and management of farm animals. Disposal of animal wastes from different farms.

Products and by-products: Elementary knowledge on slaughter house by products. Composition and food value of meat and factors affecting quality and quantity of meat.

Department of Animal Science
Level 1, Semester 1

Recommended Books (AS 113 & 114)

Department of Animal Science
Level 3, Semester 1

COURSE NO. AS 313
Course Title: Animal Waste Management
Credit hour: 2

Introduction and glossary of waste management in livestock farms.
Importance and objectives of waste management.
Measures for handling farm wastes.
Methods for processing and treatment of animal wastes.
Effects of Animal wastes on public health and environment.
Disposal of animal wastes.
Safety and regulation of animal wastes.

**Department of Animal Science**

**Level-3, Semester-1**

**COURSE NO. AS 314**

Course Title: Animal Waste Management
Credit hour: 1

Identification of farm animal wastes.
Handling of wastes in animal farm
Storage and treatments of animal waste
Disposal of animal wastes.

**Books Recommended (313 & 314)**


**Department of Dairy Science**

**Level-2, Semester-I**

**COURSE NO.: DS 213**

Course Title: Elementary Dairy Science
Credit hour: 3

Introduction of Dairy Science Department.
Definition of Dairy Science.
Statistics related to dairying of Bangladesh and leading dairy countries.
Terminology of dairy cattle.
History of dairying.
Taxonomy-origin and classification of dairy animals.
Characteristics of important dairy breeds – local and foreign.
Importance of dairy farming.
Milk production and its utilization in different leading countries.
Feeding and management problem of Dairy animals.
Use of bedding and disposal of farmyard manure.
Principles of dairy farm management with special reference to veterinary activities.
Cleaning, sanitation and sterilization of farm equipment.
Preliminary knowledge about milking.
Keeping health-records for dairy herd.
Introduction, definition and composition of milk.
Food value of milk.
Sources of contamination of milk and their control.

**Department of Dairy Science**

**Level-2, Semester-I**

**COURSE NO.: DS 214**
Course Title: Elementary Dairy Science  
Credit hour: 1

General information about the Bangladesh Agricultural University dairy farm and an ideal dairy farm. 
Name of common house at the Bangladesh Agricultural University dairy farm and an ideal dairy farm. 
Identification of different dairy breeds of cow and buffalo.

Handling of Dairy Cows, Calves, Heifers, Bulls and Buffaloes. 
Identification and uses of dairy utensils and equipment. 
Identification of Dairy Animals (tagging, tattooing, branding, marking). 
Dentition and ageing. 
Health records of dairy cattle as the source of diagnosis of diseases and treatment. 
Cleaning and washing of dairy animals and dairy utensils and equipments.

Books Recommended (DS 213 & 214)
8. Brochure of Animal Husbandry-Published by Dean of Animal Husbandry.

Department of Poultry Science  
Level 1, Semester II

COURSE NO. : PS 123  
Course Title : Elementary Poultry Science  
Credit hour : 3

Different body system; Digestive system, Skeletal system, Reproductive system and Respiratory system and their relations with meat and egg production. 

Space requirements for different species. Incubation periods of different species. Principles and practices of incubation. 
Selection of eggs for hatching. Different types of Poultry farms. Different types of houses for poultry. Site selection for poultry farm. Brooding of chicks 
Principles and methods of poultry feeding. Sexing, debeaking and selection of breeding stock; culling. Lighting and other management practices in poultry farming.

Department of Poultry Science  
Level 1, Semester II

COURSE NO. : PS 124

Course Title : Elementary Poultry Science  
Credit hour : 1

Holding and handing of poultry. 
Identification of different body external parts of poultry. 
Demonstration of internal body parts of poultry. 
Identification of different poultry species. 
Identification of breeds and varieties. 
Identification of eggs of different poultry species, hatching, brooding, sexing, debeaking. 
Culling and selection of breeding stocks. 
Identification of different equipments and appliances.
Identification & poultry feed staff, methods of feeding, feeding schedule.
Demonstration on poultry housing.
Demonstration on different floor systems.

**Books Recommended (PS 123 & 124)**

New york, gohn wiley and Sout. Iuc, London-Chapman and Hall Ltd.

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**Department of Farm Structure**

Level-4, Semester-1

**COURSE NO. FS 413**

Course Title : Livestock Farm Design and Environment

Credit hour : 3

Farmstead planning considerations, site selections, farm classification, space requirements and basic design criteria.
Constructions materials : Brick, sand, cement, timber and steel; material and cost estimation of brick, concrete, timber and steel works.

Livestock housing : Farm components, floor components in relation to animal comfort and disease, herd size calculation, layout design of barn, hospital, maternity area and milking center, confined and loose houses design, housing for calves and heifers. Layout and design of poultry houses.

Abattoirs : Specifications, design requirements and layout, environment and hygienic factors.

Environmental factors : Climatic conditions for livestock, heat, vapor and air exchange in livestock sheds, air flow patterns, air-moisture-temperature relationship and its impacts.

Environmental controls : Purposes of ventilation, natural and artificial ventilations, air pressure and velocity, relative humidity, quantify number and sizes of fans, air inlet area, evaporative cooling system, heat and moisture balance, ventilation for cold and rainy days.

Water supply : Water storage, supply and drainage for livestock farms.

Lighting : Fundamentals of lighting, natural and artificial lighting.

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**Department of Farm Structure**

Level-4, Semester-1

**COURSE NO. FS 414**

Course Title : Livestock Farm Design and Environment

Credit hour : 1

- a) Lab exercise :
  - i) Planning and layout design of a typical farmstead
  - ii) Design of commercial livestock farms

- b) Visit to abattoirs and livestock farms

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**Books Recommended (FS 413 & 414)**

2. Functional Design handbook for Australian Farm Buildings-G.J. Redding
3. Farm Structures-H.J. Barre and L.L. Sammet
4. Planning and Design of Farm Buildings with reference to Bangladesh conditions-M.W. Ullah
Course Title: Farm Operation and Management  
Credit hour: 3

1. Management: Concepts and theories of management, organization and administration, Introduction to Farming Systems  
2. Leadership: Types of leadership, leadership characteristic, Function of a Manager.  
3. Linear Programming: Introduction, model formulation and solution, application to livestock farm management.  
5. Management of Clinic and Farm: Location and layout of Clinic & Farm.  
6. Inventory model: Introduction of model and solution, application to medicine and feed inventory system.  
7. Transportation and distribution model: Application to medicine, feed and livestock products.  
8. Queueing theory: Introduction, characteristic, application to clinical service design and management.  
10. Operation and maintenance of farm equipment, with special reference to hygienic interventions and safety measures.

Department of Farm Power and Machinery  
Level-4, Semester-1  
COURSE NO.: FPM 4102  
Course Title: Farm Operation and Management  
Credit hour: 1

1) Lab exercises: linear programming, inventory model, transportation model with application to dairy, poultry and zoo management.  
2) Project proposal preparation, project logical frame work, activity bar-chart & budget  
3) Field visits

Books Recommended (FPM 4101 & 4102)  
4. Organization and Management - B.S. Blanchard, Prentice-Hall, New Delhi  

Department of Agricultural Economics  
Level-5 Semester-1  
COURSE NO. AE 511  
Course Title: Livestock Production Economics;  
Credit hour: 3

1. Economic Concepts of Livestock Production  
Definition and concepts of Economics and Livestock Economics, Scope of Economics, Economic principles applicable to Livestock production  
2. Theory of Demand and Supply  
Meaning and types of demand, Law of demand, Factors influencing demand, Demand function, Demand schedule, Demand curves, Changes in demand, Elasticity of demand.  
Indifference curve analysis, Marginal rate of substitution, Properties of indifference curves, Consumer’s equilibrium.  
Meaning of supply, Factors influencing supply, Supply function, Supply curves, Supply elasticity.  
3. Livestock Production  
Theory of production, Factors of production, Production function, Stages of production, Laws of returns, Cost and return of livestock production.  
4. Marketing of Livestock Products  
Meaning of market, Classification of market, Characteristics of market, Price determination of livestock products under perfect competition, Marketing channel, Marketing margin and efficiency, Marketing functions: Standardization and grading of livestock products.  
5. Project Analysis in Livestock Production  
Meaning of project, Undiscounted and discounted measures of project worth: BCR, NPV and IRR.

Department of Agricultural Economics  
Level-5 Semester-1  
COURSE NO. AE 512  
Course Title: Livestock Production Economics;  
Credit hour: 1

1. Cost and return analysis  
2. Analysis of marketing cost and margin  
3. Application of project appraisal technique in livestock production
Books Recommended (AE 511 & 512)

Department of Languages
Level 1, Semester 1
COURSE NO. LAN 111
Course Title: English Language
Credit hour: 2

Textual study and comprehension of a few selective BBC talks
Socio-linguistic rules to perform language function in English.
Basic grammatical structures
Types and constructional forms of sentences; Sequence of tense; Verbs, Verb patterns and verb modifiers; Syntax including transformation and combination of sentence and framing of WH-questions.
Nouns, determiners and adjectives; Adverbials; Prepositional phrases; Headword, Infinitive phrases; Participle phrases; Appositives.
Mechanics- Punctuation, Quotation marks, Capitalization, Numbers, Abbreviation, Italics, Spelling (including most common mistakes).

Principles and methods of composition : Precis, Abstract or Summary, Paragraphs, Letters, Short Essays and Reports.

Books Recommended

Department of Agricultural Statistics
Level -2, Semester -II
COURSE NO. :STAT 215
Course Title : Biostatistics
Credit hour : 2


**Department of Agricultural Statistics**  
Level -2, Semester -II  
**COURSE NO. :STAT 216**

Course Title: Biostatistics  
Credit hour: 1

Frequency tables and their graphical representation. Measures of location and variation. Moments. Measures of skewness and kurtosis. Pearson” correlation coefficient. Fitting linear regression to observed data by the method of least squares. Statistical tests: A population mean is equal to a specified value, equality of two population means (for both independent & correlated samples), a population proportion is equal to a specified value, equality of two population means (for both independent & correlated samples), a population proportion is equal to a specified value, equality of two population proportions, independence of attributes, significance of correlation and regression coefficients. Analysis of variance for completely randomized and randomized block designs.

Recommended Books (STAT 215 & 216)  

**Department of Agricultural Extension Education**  
Level -4, Semester -II  
**COURSE NO. :AGEXT 423**

Course Title: Agricultural Extension Education  
Credit hour: 3

Agricultural Extension: Concept, meaning and principles of Agricultural Extension; Importance of veterinary extension and livestock situation in Bangladesh.  
Extension Organization and Leadership: Meaning and features of an extension organization. Meaning types and forms of leadership. Qualifications of a good leader, role of professional and local leaders.  
Motivation and learning: Concept and meaning of motivation. Maslow’s need theory. Learning process and laws of learning with their implications.  
Communication in Extension: Meaning and importance of communication process. Key elements in the communication process. Factors affective communication in extension work for livestock development.  
Extension Teaching Methods: Classification of extension teaching methods, Essential elements, requirements and preparing/conducting of important extension teaching methods, advantages and limitations of using different extension teaching methods with reference to Bangladesh condition.  
Diffusion and Adoption of Innovation: Innovation and its types; elements in the diffusion process; paradigm of innovation decision process; innovativeness and adopter categories.  
Programme Planning and Evaluation in Extension: Concept, importance, principles and steps of extension programme planning for livestock development. Meaning, purpose, principles and steps of monitoring and evaluation of projects related to veterinary extension work.
**COURSE NO. : AGEXT 424**

Course Title: Agricultural Extension Education  
Credit hour : 1

An orientation to different organizations related to agricultural and livestock development. 
Preparation of interview schedule for collection of data about rural and livestock situation. 
Preparation of teaching aids: poster, flashcards and leaflets. 
Group discussion techniques: lecture, Role playing and Philip 66. 
Extension Field trip to rural areas/Upazila Headquarters to observe rural development activities in the field situation with special emphasis on livestock.

**Books Recommended (AGEXT 423 & 424)**


**Department of Biochemistry**  
Level -1, Semester -1

**COURSE NO. : BCHEM 111**  
Course title : Biophysics and Chemistry of Biomolecules  
Credit hour : 3


Spectrophotometry, Electrophoresis, Isoelectric focussing chromatography.

**Carbohydrates:** Occurrence, classification, biological importance of carbohydrates and their derivatives. Cell wall polysaccharides.


**Lipids:** Classification, biological importance and functions. Chemistry of fatty acids, fats, phospholipids, sphingolipids, glycolipids, lipoproteins and sterols. Lipids as membrane constituents. Characterization of fat.

**Nucleic acids:** Occurrence, classification, composition, structural features and physicochemical properties.

**Hormones:** Chemical nature, classification and biochemical functions.

**Books Recommended:**


Biochemistry, by Lubert Stryer, 1986 Published by S.K. Jain for CBS Publishers and Distributors, 485 Jain Bhawan, Bola Nath Nagar, Delhi, India.


Department of Biochemistry
Level -1, Semester -1
COURSE NO. : BCHEM 112
Course title : Biophysics and Chemistry of Biomolecules
Credit hour : 1

Books Recommended:

William Heinemann Medical Books Ltd. London, U.K.

Department of Biochemistry
Level 1, Semester II
COURSE NO. : BCHEM 123
Course Title : Metabolism of Biomolecules.
Credit hour : 3
Free energy, Entrophy and enthalpy. Exergonic and endergonic reactions. ADP-ATP cycle.

An overview of metabolism.
Stages in the breakdown of biomolecules.
Lipid metabolism: Biological oxidation of fatty acids. Propionate catabolism in animals. Ketone body formation, utilization and physiological effects of ketosis. Biosynthesis of fatty acids.
Nucleic acid metabolism: Replication, transcription and translation. Recombinant DNA.
Vitamin and Mineral: Sources and biochemical functions.

Books Recommended:

Department of Biochemistry

Level 1, Semester II
COURSE NO. : BCHEM 124
Course Title : Metabolism of Biomolecules.
Credit hour : 1

Separation of albumins and globulins.
Determination of isoelectric pH.
Estimation of proteins by Kjeldahl and Biuret methods.
Determination of saponification value, iodine value and acid value.
Estimation of cholesterol.
Estimation of serum phosphorus.
Assay of SAP, SGPT and SGOT.

Books Recommended:

Department of Agronomy

Level -2, Semester-1
COURSE NO. : AGRON 211
Course title : Forage Agronomy
Credit hour : 2

Introduction to Agronomy: Definition and scope of Agronomy. Relationship of Agronomy with other branches of Agriculture.
Climatology: Concept of weather and climate. Effect of temperature, day length and solar radiation on growth, development and yield of crops. Cropping seasons of Bangladesh and their characteristics.

Tillage: Concept, objectives and types of tillage. Effect of tillage on soil characteristics and nutrient availability.
Charateristics of ideal tilth.
Intercultural Operations: Weeding, mulching and thinning, irrigation and drainage– their objectives, methods, advantages and disadvantages.
Production Technology of Fodder Crops: Origin and distribution, botanical description, climate and soil requirements, cultivation practices of the crops used as animal feed and fodder such as maize, sorghum, triticale, rice; cowpea, soybean, barseem, alfalfa, sunnhemp, dhaincha, German grass: napier, para, guinea and pangola grasses.
Pasture and Pasture Management: Concept and importance of pasture. Pasture establishment, management of pasture, and pasture herbage utilization. Feasibility of pasturing in Bangladesh.

Department of Agronomy
Identification and study of farm implements
Identification and study of crops
Identification and study of seeds
Identification and study of weeds
Identification and study of manures and fertilizers
Practising ploughing and determination of efficiency of plough.
Practising weeding, thinning and gap filling.
Practising mulching operations.
Preparation of compost.
Preservation of farm yard manures.
Practising different methods of application of manures and fertilizers.
Preparation of silage
Preparation of hay
Purity test of seed
Germination test of seed.
Study of the effect of plant nutrients/seed rate/plant density on the performance of a fodder crop in students’ plot.

Books Recommended (Agron 211 & 212)

Department of Computer Science & Mathematics

Computer science and computer fundamentals, hardware and software, data and information, information coding, number systems and their internal representation, program and algorithm.

Computer operations in DOS and Windows environment; familiarity with the use of application software: text processing, electronic sheet, data entry and management presentation materials preparation, statistical analysis, photoshop and illustration.

Books Recommended
Office XP reference manual
Windows manual.